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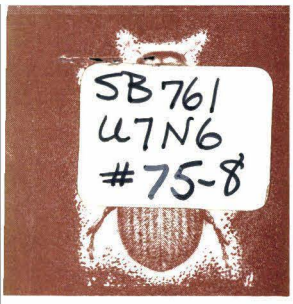

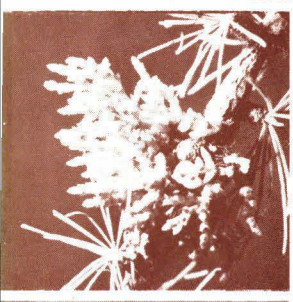

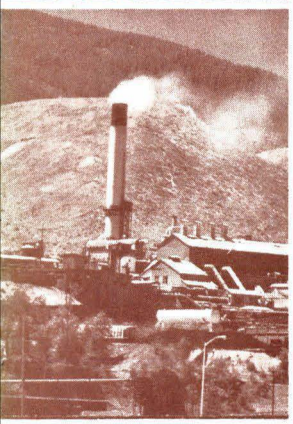

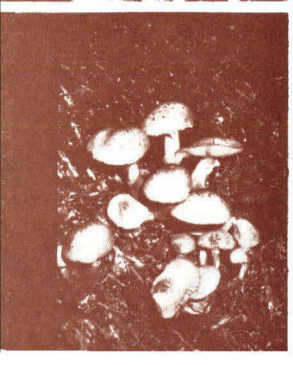

# FOREST ENVIRONMENTAL PROTECTION

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## STATUS OF THE WESTERN FALSE HEMLOCK LOOPER INFESTATION IN THE UPPER FLATHEAD VALLEY, MONTANA - 1974

by

Hubert E. Meyer 1/, Steve Kohler 2/, and Jerald E. Dewey 3/

### INTRODUCTION

Western false hemlock looper, *Neptyia freemani* Munroe, outbreak reported in 1973 (Dewey and Kohler, 1974) declined in total acreage, but persisted at epidemic levels in 1974 (Figure 1). Much of the original area of defoliation had recovered in 1974 to the degree that it was no longer aerially visible. However, defoliation was more severe in some 1974 damage areas. Several hundred acres of heavy defoliation that could result in top kill occurred near Kalispell. Two new spot infestations were detected about 10 miles north of the previous infestation boundary.

The western false hemlock looper does not have a history of being particularly damaging in Region 1; therefore, no control measures are being contemplated. However, the outbreak is being monitored to collect data on its intensity and duration. An egg mass survey was conducted to determine the outbreak potential for 1975.

### METHODS

Infested area was aerially mapped in August. Egg mass survey plots were established in December at seven representative locations (Figure 1) to obtain data on population trend and defoliation potential for 1975.

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1/ Biological Technician (Insects), Forest Environmental Protection, State and Private Forestry, USDA Forest Service, Missoula, Montana.

2/ Entomologist, Division of Forestry, Dept. of Natural Resources and Conservation, State of Montana, Missoula, Montana.

3/ Entomologist, Forest Environmental Protection, State and Private Forestry, USDA Forest Service, Missoula, Montana.

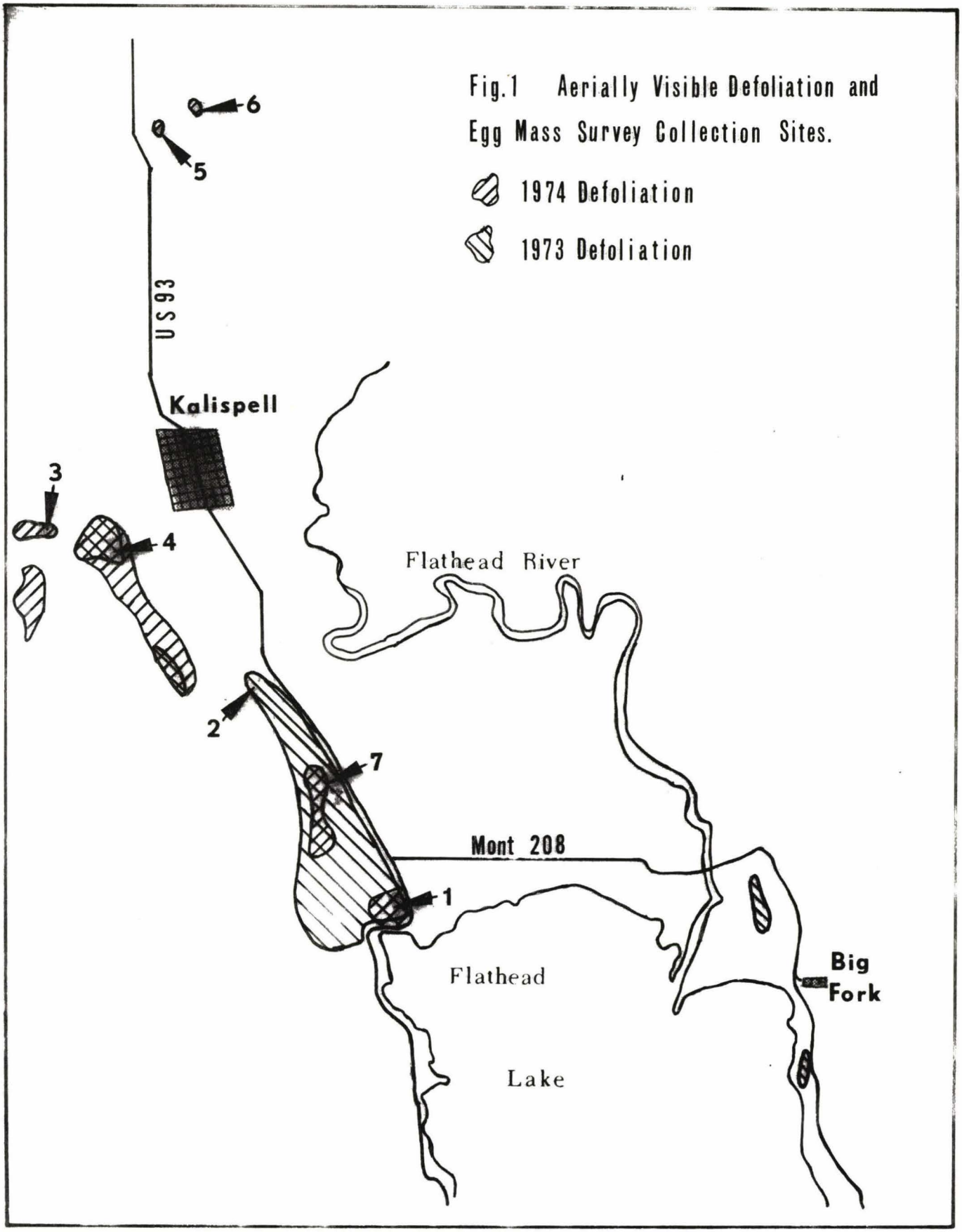
Fig.1 Aerially Visible Defoliation and Egg Mass Survey Collection Sites.
1974 Defoliation
1973 Defoliation
US 93
Kalispell
Flathead River
Mont 208
Flathead
Lake
Big Fork
1
2
3
4
5
6
7

At each plot two 24-inch branches from a height of approximately 20 feet were collected from each of five Douglas-fir sample trees. Branches were taken to the laboratory, measured, and examined for new (1974) and old (1973) eggs.

## RESULTS AND DISCUSSION

Aerial surveys showed 1,760 acres of aerially visible defoliation attributable to the western false hemlock looper. This was a reduction from the 3,000 acres of defoliation identified in 1973. Infestation showed a trend toward reduced defoliation in the southern portion of the 1973 outbreak area and increased intensity in the northern portion.

Egg counts in 1974 were appreciably lower than 1973's average of 38.9 new eggs per square foot of foliage.

No attempt was made to systematically measure effect of natural enemies (parasites, predators, disease) on the looper population. An examination of infested areas in late August, when most of the loopers were final instar larvae or pupae, revealed considerable parasite activity, and diseased larvae were conspicuous. Egg parasitism in 1973 ranged from 10 to 59 percent in the plots surveyed (Dewey and Kohler, 1974). It is expected that egg parasitism will be an important factor in egg viability in 1975.

Survey data indicated the infestation will decline. Areas of highest 1974 egg counts (plots 5 and 6) have quite comparable egg densities with the plots having the lowest 1973 egg counts (Table 1). This number of eggs in 1973 resulted in only light defoliation in 1974; thus, serious damage is not expected to occur in 1975.

Table 1.--Western false hemlock looper egg density data, upper Flathead Valley, December 1974.

| Plot no. | Total new eggs | Total old eggs | Ratio of old to new eggs | New eggs per sq. ft. foliage |
|---|---|---|---|---|
| 1 | 822 | 418 | 1: 2.11 | 18.60 |
| 2 | 104 | 140 | 1: .71 | 2.03 |
| 3 | 281 | 443 | 1: .63 | 5.51 |
| 4 | 28 | 108 | 1: .30 | .80 |
| 5 | 1,188 | 357 | 1: 3.33 | 26.01 |
| 6 | 877 | 67 | 1:13.09 | 23.54 |
| 7 | 390 | 353 | 1: 1.10 | 5.65 |
| Average | 535 | 269 | 1: 1.98 | 11.73 |

Western false hemlock looper is also currently epidemic in British Columbia. The outbreak began in 1972 with defoliation of 3,200 acres (Ross et al., 1973). It spread to 5,000 acres in 1973 (Cottrell, 1974) and over 14,000 acres were defoliated in 1974 (Fiddick, 1974). Heavy defoliation resulting in top kill and tree mortality occurred in many areas. Egg mass surveys indicate looper populations will remain high in 1975 in British Columbia (Fiddick, 1974).

There appears to be a similarity in the factors dealing with stand characteristics (e.g., habitat type, density, age class, etc.) and climatic conditions that trigger western false hemlock looper and Douglas-fir tussock moth, *Orgyia pseudotsugata* McD., outbreaks. Much of the current area of looper infestation in Montana was heavily defoliated in 1963 and 1964 by the tussock moth (Tunnock, 1973). Though tussock moth has not been detected in the area since then, a new outbreak was detected in 1974, about 20 miles to the south along the southwest side of Flathead Lake.

The current western false hemlock looper outbreak in British Columbia overlaps with a Douglas-fir tussock moth infestation. High populations of both species exist in many areas (Fiddick, 1974).

It seems more than coincidental that these two defoliators that are quite cyclic and historically have a relatively restricted range in Montana and British Columbia should occur at epidemic levels in the same areas during the same years.

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